DESIGN ALLIANCE

August 3, 2009

Iowa Finance Authority
Joseph Jones
2015 Grand Avenue
Des Moines, Iowa 50312

Re: Waukee Public Works Facility
Statement of Compliance – State Energy Code- Building Envelope

Dear Joseph,

The building envelope for the Waukee Public Works Facility has been designed to comply with the State of Iowa Energy Code (ASHRAE 90.1-2004 as referenced in the 2006 IECC). Attached please find a copy of the Building Envelope Compliance Certificate and Energy Requirements checklist as generated by the COMCheck building energy codes program for compliance with the 2006 IEC.

Sincerely,

Jerry Purdy AIA
Principal

COM*check* Software Version 3.6.1

Envelope Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title : Waukee Public Works Facility

Construction Site:
Waukee, IA 50263

Owner/Agent:
City of Waukee
Waukee, IA 50263

Designer/Contractor:
Design Alliance, Inc.
14225 University Avenue
Suite 110
Waukee, IA 50263
515-225-3469

Section 2: General Information

Building Location (for weather data):	**Waukee, Iowa**
Climate Zone:	**5a**
Heating Degree Days (base 65 degrees F):	**6497**
Cooling Degree Days (base 50 degrees F):	**3371**
Vertical Glazing / Wall Area Pct.:	**1%**

Activity Type(s)	Floor Area
Office	8263
Workshop	53209

Section 3: Requirements Checklist

Envelope PASSES: Design 39% better than code.

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor
Roof 1: Metal Building, Standing Seam	63088	0.0	19.0	0.051	0.065
Exterior Wall 1: Concrete Block:8", Partially Grouted, Cells Empty,Normal Density , Furring: None Comments: South Masonry Wall	5431	---	12.5	0.070	0.106
Window 1: Metal Frame with Thermal Break:Double Pane with Low-E, Clear, SHGC 0.40, PF 0.63 Comments: South Glazing @ Masonry Walls w/ Sun Shade	80	---	---	0.300	0.550
Window 2: Metal Frame with Thermal Break:Double Pane with Low-E, Clear, SHGC 0.40 Comments: South Glazing @ Masonry Walls	16	---	---	0.300	0.550
Door 1: Glass (> 50% glazing), Entrance Door, SHGC 0.40, PF 0.54 Comments: South Entrance Door w/ Canopy	49	---	---	0.300	1.200
Door 2: Insulated Metal, Swinging Comments: South Insulated H.M. Doors	84	---	---	0.133	0.700
Door 3: Other, Non-Swinging Comments: South Aluminum Overhead Doors	504	---	---	0.330	1.450
Exterior Wall 2: Solid Concrete:8" Thickness,Normal Density , Furring: None Comments: South Precast Walls	2440	---	10.0	0.088	0.112
Exterior Wall 3: Metal Building Wall Comments: South Metal Wall Panel Walls	3468	0.0	12.0	0.078	0.057
Window 3: Metal Frame with Thermal Break:Double Pane with Low-E, Clear, SHGC 0.40	192	---	---	0.300	0.550

Comments: South Glazing @ Metal Wall Panels					
Exterior Wall 4: Solid Concrete:8" Thickness,Normal Density , Furring: None Comments: East Precast Walls	2000	---	10.0	0.088	0.112
Door 4: Insulated Metal, Swinging Comments: East Insulated H.M. Doors	63	---	---	0.133	0.700
Door 5: Insulated Metal, Non-Swinging Comments: East Overhead Sectional Doors	979	---	---	0.059	1.450
Exterior Wall 5: Metal Building Wall Comments: East Metal Wall Panel Walls	4358	0.0	12.0	0.078	0.057
Door 6: Insulated Metal, Non-Swinging Comments: East Overhead Sectional Doors	738	---	---	0.059	1.450
Exterior Wall 6: Solid Concrete:8" Thickness,Normal Density , Furring: None Comments: North Precast Walls	4160	---	10.0	0.088	0.112
Door 7: Insulated Metal, Swinging Comments: North Insulated H.M. Doors	147	---	---	0.133	0.700
Door 8: Insulated Metal, Non-Swinging Comments: North Overhead Sectional Doors	685	---	---	0.059	1.450
Exterior Wall 7: Metal Building Wall Comments: North Metal Wall Panel Walls	7244	0.0	12.0	0.078	0.057
Door 9: Insulated Metal, Non-Swinging Comments: North Overhead Sectional Doors	516	---	---	0.059	1.450
Exterior Wall 8: Solid Concrete:8" Thickness,Normal Density , Furring: None Comments: West Precast Walls	2000	---	10.0	0.088	0.112
Door 10: Insulated Metal, Swinging Comments: West Insulated H.M. Doors	63	---	---	0.133	0.700
Door 11: Insulated Metal, Non-Swinging Comments: West Overhead Sectional Doors	752	---	---	0.059	1.450
Exterior Wall 9: Metal Building Wall Comments: West Metal Wall Panel Walls	4358	0.0	12.0	0.078	0.057
Door 12: Insulated Metal, Non-Swinging Comments: West Overhead Sectional Doors	564	---	---	0.059	1.450
Floor 1: Slab-On-Grade:Unheated, Vertical 4 ft. Comments: Perimeter of Building	1576	---	10.0	---	---

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

Air Leakage, Component Certification, and Vapor Retarder Requirements:

- ☐ 1. All joints and penetrations are caulked, gasketed or covered with a moisture vapor-permeable wrapping material installed in accordance with the manufacturer's installation instructions.
- ☐ 2. Windows, doors, and skylights certified as meeting leakage requirements.
- ☐ 3. Component R-values & U-factors labeled as certified.
- ☐ 4. Insulation installed according to manufacturer's instructions, in substantial contact with the surface being insulated, and in a manner that achieves the rated R-value without compressing the insulation.
- ☐ 5. No roof insulation is installed on a suspended ceiling with removable ceiling panels.
- ☐ 6. Stair, elevator shaft vents, and other outdoor air intake and exhaust openings in the building envelope are equipped with motorized dampers.
- ☐ 7. Cargo doors and loading dock doors are weather sealed.
- ☐ 8. Recessed lighting fixtures are: (i) Type IC rated and sealed or gasketed; or (ii) installed inside an appropriate air-tight assembly with a 0.5 inch clearance from combustible materials and with 3 inches clearance from insulation material.
- ☐ 9. Building entrance doors have a vestibule equipped with closing devices.
  Exceptions:
  Building entrances with revolving doors.
  Doors that open directly from a space less than 3000 sq. ft. in area.
- ☐ 10. Vapor retarder installed.

Section 4: Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed envelope system has been designed to meet the 2006 IECC requirements in COM*check* Version 3.6.1 and to comply with the mandatory requirements in the Requirements Checklist.

JERRY PURDY, PRES. 8/3/9

Name - Title	Signature	Date

Twin Rivers Engineering Consultants

1000 Illinois Street
Des Moines, Iowa 50314

515-288-3679 phone
515-288-4012 fax
www.twinriverseng.com

July 31, 2009

Iowa Finance Authority
Joseph Jones
2015 Grand Avenue
Des Moines, Iowa 50312

Subject: Waukee Public Works Facility
Statement of Compliance – State Energy Code – Mechanical

Dear Joseph,

The mechanical system for the Waukee Public Works Facility has been design to comply with the State of Iowa Energy Code (ASHRAE 90.1-2004 as referenced in the 2006 IECC). Attached are the Mechanical Compliance Certificate and Mechanical Requirements Description generated by the COMCheck building energy codes program for compliance with 2006 IECC.

Sincerely,

David J. Losen, P.E.
Principal

COMcheck Software Version 3.6.1
Mechanical Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title : Waukee Public Works

Construction Site:
Waukee, IA

Owner/Agent:
John Gibson
City of Waukee
Waukee, IA 50263

Designer/Contractor:
Twin Rivers Engineering Consultants
1000 Illinois Street
Des Moines, IA 50314

Section 2: General Information

Building Location (for weather data):	**Waukee, Iowa**
Climate Zone:	**5a**
Heating Degree Days (base 65 degrees F):	**6497**
Cooling Degree Days (base 50 degrees F):	**3371**

Section 3: Mechanical Systems List

Quantity	System Type & Description
1	HVAC System 1: Heating: Central Furnace, Gas, Capacity 88 kBtu/h / Cooling: Split System, Capacity 45 kBtu/h, Air-Cooled Condenser / Single Zone
1	HVAC System 2: Heating: Central Furnace, Gas, Capacity 44 kBtu/h / Cooling: Split System, Capacity 34 kBtu/h, Air-Cooled Condenser / Single Zone
1	HVAC System 3: Heating: Central Furnace, Gas, Capacity 88 kBtu/h / Cooling: Split System, Capacity 55 kBtu/h, Air-Cooled Condenser / Single Zone
1	HVAC System 4: Heating: Central Furnace, Gas, Capacity 88 kBtu/h / Cooling: Split System, Capacity 56 kBtu/h, Air-Cooled Condenser / Single Zone
1	HVAC System 5: Heating: Central Furnace, Gas, Capacity 66 kBtu/h / Cooling: Split System, Capacity 34 kBtu/h, Air-Cooled Condenser / Single Zone
1	HVAC System 6: Heating: Central Furnace, Gas, Capacity 88 kBtu/h / Single Zone
1	HVAC System 8: Heating: Unit Heater, Gas, Capacity 75 kBtu/h
1	HVAC System 9: Heating: Unit Heater, Gas, Capacity 125 kBtu/h
1	Water Heater 1: Gas Storage Water Heater, Capacity: 100 gallons, Input Rating: 240 Btu/h w/ Circulation Pump

Section 4: Requirements Checklist

Requirements Specific To: HVAC System 1 :

☐ 1. Newly purchased heating equipment meets the heating efficiency requirements
☐ 2. Equipment minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 2 :

☐ 1. Newly purchased heating equipment meets the heating efficiency requirements
☐ 2. Equipment minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 3 :

☐ 1. Newly purchased heating equipment meets the heating efficiency requirements
☐ 2. Equipment minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 4 :

☐ 1. Newly purchased heating equipment meets the heating efficiency requirements

☐ 2. Equipment minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 5 :

☐ 1. Newly purchased heating equipment meets the heating efficiency requirements
☐ 2. Equipment minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 6 :

☐ 1. Newly purchased heating equipment meets the heating efficiency requirements

Requirements Specific To: HVAC System 8 :

☐ 1. Equipment minimum efficiency: Unit Heater (Gas): 80.0 % Ec

Requirements Specific To: HVAC System 9 :

☐ 1. Equipment minimum efficiency: Unit Heater (Gas): 80.0 % Ec

Requirements Specific To: Water Heater 1 :

☐ 1. Hot water system sized per manufacturer's sizing guide
☐ 2. Gas Storage Water Heater efficiency: 80.0 % Et (311 SL, kBtu/h)
☐ 3. All piping in circulating system insulated
☐ 4. Hot water storage temperature adjustable down to 120 degrees F or lower
☐ 5. Automatic time control of heat tapes and recirculating systems present
☐ 6. Controls will shut off operation of circulating pump between water heater/boiler and storage tanks within 5 minutes after end of heating cycle

Generic Requirements: Must be met by all systems to which the requirement is applicable:

☐ 1. Load calculations per 2001 ASHRAE Fundamentals
☐ 2. Plant equipment and system capacity no greater than needed to meet loads
- Exception: Standby equipment automatically off when primary system is operating
- Exception: Multiple units controlled to sequence operation as a function of load

☐ 3. Minimum one temperature control device per system
☐ 4. Minimum one humidity control device per installed humidification/dehumidification system
☐ 5. Automatic Controls: Setback to 55 degrees F (heat) and 85 degrees F (cool); 7-day clock, 2-hour occupant override, 10-hour backup
- Exception: Continuously operating zones
- Exception: 2 kW demand or less, submit calculations

☐ 6. Outside-air source for ventilation; system capable of reducing OSA to required minimum
☐ 7. R-5 supply and return air duct insulation in unconditioned spaces R-8 supply and return air duct insulation outside the building R-8 insulation between ducts and the building exterior when ducts are part of a building assembly
- Exception: Ducts located within equipment
- Exception: Ducts with interior and exterior temperature difference not exceeding 15 degrees F.
- Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification

☐ 8. Mechanical fasteners and sealants used to connect ducts and air distribution equipment
☐ 9. Ducts sealed - longitudinal seams on rigid ducts; transverse seams on all ducts; UL 181A or 181B tapes and mastics
☐ 10. Hot water pipe insulation: 1 in. for pipes <=1.5 in. and 2 in. for pipes >1.5 in. Chilled water/refrigerant/brine pipe insulation: 1 in. for pipes <=1.5 in. and 1.5 in. for pipes >1.5 in. Steam pipe insulation: 1.5 in. for pipes <=1.5 in. and 3 in. for pipes >1.5 in.
- Exception: Piping within HVAC equipment.
- Exception: Fluid temperatures between 55 and 105 degrees F.
- Exception: Fluid not heated or cooled.
- Exception: Runouts <4 ft in length.

☐ 11. Operation and maintenance manual provided to building owner
☐ 12. Piping, insulated to 1/2 in. if nominal diameter of pipe is <1.5 in.; Larger pipe insulated to 1 in. thickness
☐ 13. Lavatory faucet outlet temperatures in public restrooms limited to 110 degrees F (43 degrees C)
☐ 14. Thermostatic controls have 5 degrees F deadband
- Exception: Thermostats requiring manual changeover between heating and cooling
- Exception: Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.

☐ 15. Balancing devices provided in accordance with IMC (2006) 603.17

☐ 16. Motorized, automatic shutoff dampers required on exhaust and outdoor air supply openings

- Exception: Gravity dampers acceptable in buildings <3 stories
- Exception: Gravity dampers acceptable in systems with outside or exhaust air flow rates less than 300 cfm where dampers are interlocked with fan

☐ 17. Stair and elevator shaft vents are equipped with motorized dampers

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2006 IECC requirements in COM*check* Version 3.6.1 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title	Signature	Date

COM*check* Software Version 3.6.1

Mechanical Requirements Description

2006 IECC

The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: HVAC System 1 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 2 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 3 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 4 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 5 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.
2. The specified heating and/or cooling equipment is covered by ASHRAE 90.1 Code and must meet the following minimum efficiency: Split System: 10.0 SEER

Requirements Specific To: HVAC System 6 :

1. The specified heating equipment is covered by Federal minimum efficiency requirements. New equipment of this type can be assumed to meet or exceed ASHRAE 90.1 Code requirements for equipment efficiency.

Requirements Specific To: HVAC System 8 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1 Code and must meet the following minimum efficiency: Unit Heater (Gas): 80.0 % Ec

Requirements Specific To: HVAC System 9 :

1. The specified heating and/or cooling equipment is covered by the ASHRAE 90.1 Code and must meet the following minimum efficiency: Unit Heater (Gas): 80.0 % Ec

Requirements Specific To: Water Heater 1 :

1. Service water heating system design loads for the purpose of sizing systems and equipment must be determined in accordance with manufacturers' published sizing guidelines.
2. Service water heating equipment used solely for heating potable water, pool heaters, and hot water storage tanks must meet the following miniumum efficiency: Gas Storage Water Heater efficiency: 80.0 % Et (311 SL, kBtu/h)
3. Insulation must be provided for recirculating system piping, including the supply and return piping of a circulating tank type water heater.

4. Temperature controls must be provided that allow for storage temperature adjustment from 120 degrees F or lower to a maximum temperature compatible with the intended use except when the manufacturer's installation instructions specify a higher minimum thermostat setting to minimize condensation and resulting corrosion. Documentation of the installation instructions must be provided to be exempted from this requirement.
5. Systems designed to maintain usage temperatures in hot water pipes, such as recirculating hot water systems or heat trace, must be equipped with automatic time switches or other controls that can be set to switch off the temperature maintenance system during extended periods when hot water is not required.
6. When used to maintain storage tank water temperature, recirculating pumps must be equipped with controls limiting operation to the start of the heating cycle to a maximum of 5 minutes after the end of the heating cycle.

Generic Requirements: Must be met by all systems to which the requirement is applicable:

1. Design heating and cooling loads for the building must be determined using procedures in the ASHRAE Handbook of Fundamentals or an approved equivalent calculation procedure.
2. All equipment and systems must be sized to be no greater than needed to meet calculated loads. A single piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.
   - Exception: The equipment and/or system capacity may be greater than calculated loads for standby purposes. Standby equipment must be automatically controlled to be off when the primary equipment and/or system is operating.
   - Exception: Multiple units of the same equipment type whose combined capacities exceed the calculated load are allowed if they are provided with controls to sequence operation of the units as the load increases or decreases.
3. Each heating or cooling system serving a single zone must have its own temperature control device.
4. Each humidification system must have its own humidity control device.
5. The system or zone control must be a programmable thermostat or other automatic control meeting the following criteria: a) capable of setting back temperature to 55 degrees F during heating and setting up to 85 degrees F during cooling, b) capable of automatically setting back or shutting down systems during unoccupied hours using 7 different day schedules, c) have an accessible 2-hour occupant override, d) have a battery back-up capable of maintaining programmed settings for at least 10 hours without power.
   - Exception: A setback or shutoff control is not required on thermostats that control systems serving areas that operate continuously.
   - Exception: A setback or shutoff control is not required on systems with total energy demand of 2 kW (6,826 Btu/h) or less.
6. The system must supply outside ventilation air as required by Chapter 4 of the International Mechanical Code. If the ventilation system is designed to supply outdoor-air quantities exceeding minimum required levels, the system must be capable of reducing outdoor-air flow to the minimum required levels.
7. Air ducts must be insulated to the following levels: a) Supply and return air ducts for conditioned air located in unconditioned spaces (spaces neither heated nor cooled) must be insulated with a minimum of R-5. Unconditioned spaces include attics, crawl spaces, unheated basements, and unheated garages. b) Supply and return air ducts and plenums must be insulated to a minimum of R-8 when located outside the building. c) When ducts are located within exterior components (e.g., floors or roofs), minimum R-8 insulation is required only between the duct and the building exterior.
   - Exception: Duct insulation is not required on ducts located within equipment.
   - Exception: Duct insulation is not required when the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15 degrees F.
   - Exception: Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. pressure classification.
8. Mechanical fasteners and seals, mastics, or gaskets must be used when connecting ducts to fans and other air distribution equipment, including multiple-zone terminal units.
9. All joints, longitudinal and transverse seams, and connections in ductwork must be securely sealed using weldments; mechanical fasteners with seals, gaskets, or mastics; mesh and mastic sealing systems; or tapes. Tapes and mastics must be listed and labeled in accordance with UL 181A and shall be marked '181A-P' for pressure sensitive tape, '181A-M' for mastic or '181A-H' for heat-sensitive tape. Tapes and mastics used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked '181B-FX' for pressure-sensitive tape or '181B-M' for mastic. Unlisted duct tape is not permitted as a sealant on any metal ducts.
10. All pipes serving space-conditioning systems must be insulated as follows: Hot water piping for heating systems: 1 in. for pipes <=1 1/2-in. nominal diameter, 2 in. for pipes >1 1/2-in. nominal diameter. Chilled water, refrigerant, and brine piping systems: 1 in. insulation for pipes <=1 1/2-in. nominal diameter, 1 1/2 in. insulation for pipes >1 1/2-in. nominal diameter. Steam piping: 1 1/2 in. insulation for pipes <=1 1/2-in. nominal diameter, 3 in. insulation for pipes >1 1/2-in. nominal diameter.
    - Exception: Pipe insulation is not required for factory-installed piping within HVAC equipment.
    - Exception: Pipe insulation is not required for piping that conveys fluids having a design operating temperature range between 55 degrees F and 105 degrees F.
    - Exception: Pipe insulation is not required for piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
    - Exception: Pipe insulation is not required for runout piping not exceeding 4 ft in length and 1 in. in diameter between the control valve and HVAC coil.
11. Operation and maintenance documentation must be provided to the owner that includes at least the following information: a) equipment capacity (input and output) and required maintenance actions b) equipment operation and maintenance manuals c) HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions; desired

or field-determined set points must be permanently recorded on control drawings, at control devices, or, for digital control systems, in programming comments d) complete narrative of how each system is intended to operate.

12. Service hot water piping, where required, must be insulated to 1/2 in. if pipe less than 1.5 in. nominal diameter. Larger pipe must be insulated to 1 in.. Pipe insulation will have a conductivity of less than 0.28 Btu.in/(h-ft2-degrees F).
13. Temperature controlling means must be provided to limit the maximum temperature of water delivered from lavatory faucets in public facility restrooms to 110 degrees F.
14. Thermostats controlling both heating and cooling must be capable of maintaining a 5 degrees F deadband (a range of temperature where no heating or cooling is provided).
    - Exception: Deadband capability is not required if the thermostat does not have automatic changeover capability between heating and cooling.
    - Exception: Special occupancy or special applications where wide temperature ranges are not acceptable and are approved by the authority having jurisdiction.
15. Replaced with
16. Outdoor air supply and exhaust systems must have motorized dampers that automatically shut when the systems or spaces served are not in use. Dampers must be capable of automatically shutting off during preoccupancy building warm-up, cool-down, and setback, except when ventilation reduces energy costs (e.g., night purge) or when ventilation must be supplied to meet code requirements. Both outdoor air supply and exhaust air dampers must have a maximum leakage rate of 3 cfm/ft2 at 1.0 in w.g. when tested in accordance with AMCA Standard 500.
    - Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height.
    - Exception: Systems with a design outside air intake or exhaust capacity of 300 cfm (140 L/s) or less that are equipped with motor operated dampers that open and close when the unit is energized and de-energized, respectively.
17. Stair and elevator shaft vents must be equipped with motorized dampers capable of being automatically closed during normal building operation and interlocked to open as required by fire and smoke detection systems. All gravity outdoor air supply and exhaust hoods, vents, and ventilators must be equipped with motorized dampers that will automatically shut when the spaces served are not in use.
    - Exception: Gravity (non-motorized) dampers are acceptable in buildings less than three stories in height above grade.
    - Exception: Ventilation systems serving unconditioned spaces.

Twin Rivers Engineering Consultants

1000 Illinois Street
Des Moines, Iowa 50314

515-288-3679 phone
515-288-4012 fax
www.twinriverseng.com

July 31, 2009

Iowa Finance Authority
Joseph Jones
2015 Grand Avenue
Des Moines, Iowa 50312

Subject: Waukee Public Works Facility
Statement of Compliance – State Energy Code – Electrical

Dear Joseph,

The electrical system for the Waukee Public Works Facility has been designed to comply with the State of Iowa Energy Code. Attached are the Electrical Compliance Certificate and Electrical Requirements Description generated by the COMCheck building energy codes program for compliance with 2006 IECC.

Sincerely,

Dennis Bennett

Dennis M. Bennett, P.E.
Principal

COM*check* Software Version 3.6.1

Interior Lighting Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title : Waukee Public Works

Construction Site:
Waukee, IA

Owner/Agent:
John Gibson
City of Waukee
Waukee, IA 50263

Designer/Contractor:
Twin Rivers Engineering Consultants
1000 Illinois Street
Des Moines, IA 50314

Section 2: General Information

Building Use Description by: **Activity Type**

Activity Type(s)	Floor Area
Office	25368
Parking Garage	38000
Workshop	12152

Section 3: Requirements Checklist

Interior Lighting:

❑ 1. Total proposed watts must be less than or equal to total allowed watts.

Allowed Watts	Proposed Watts	Complies
53781	35879	YES

Controls, Switching, and Wiring:

❑ 2. Independent controls for each space (switch/occupancy sensor).
Exceptions:

Areas designated as security or emergency areas that must be continuously illuminated.

Lighting in stairways or corridors that are elements of the means of egress.

❑ 3. Master switch at entry to hotel/motel guest room.

❑ 4. Individual dwelling units separately metered.

❑ 5. Each space provided with a manual control to provide uniform light reduction by at least 50%.
Exceptions:

Only one luminaire in space;

An occupant-sensing device controls the area;

The area is a corridor, storeroom, restroom, public lobby or sleeping unit.

Areas that use less than 0.6 Watts/sq.ft.

❑ 6. Automatic lighting shutoff control in buildings larger than 5,000 sq.ft.
Exceptions:

Sleeping units, patient care areas; and spaces where automatic shutoff would endanger safety or security.

❑ 7. Photocell/astronomical time switch on exterior lights.
Exceptions:

Lighting intended for 24 hour use.

❑ 8. Tandem wired one-lamp and three-lamp ballasted luminaires (No single-lamp ballasts).
Exceptions:

Electronic high-frequency ballasts; Luminaires on emergency circuits or with no available pair.

Section 4: Compliance Statement

Compliance Statement: The proposed lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2006 IECC requirements in COM*check* Version 3.6.1 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title	Signature	Date

COM*check* Software Version 3.6.1

Interior Lighting Application Worksheet

2006 IECC

Section 1: Allowed Lighting Power Calculation

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts (B x C)
Office	25368	1	25368
Parking Garage	38000	0.3	11400
Workshop	12152	1.4	17013
		Total Allowed Watts =	53781

Section 2: Proposed Lighting Power Calculation

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Office (25368 sq.ft.)				
Linear Fluorescent 3: F1: 48" T8 32W / Electronic	2	12	65	780
Linear Fluorescent 16: F1A: 48" T8 32W / Electronic	4	6	125	750
Linear Fluorescent 2: F2: 48" T8 32W / Electronic	2	25	65	1625
Linear Fluorescent 1: F3: 48" T8 32W / Electronic	3	78	95	7410
Linear Fluorescent 4: F4: 48" T8 32W / Electronic	4	3	125	375
Linear Fluorescent 15: F5: 48" T8 32W / Electronic	2	19	65	1235
Linear Fluorescent 5: F7: 48" T8 32W / Electronic	2	2	65	130
Linear Fluorescent 6: F8: 24" T8 17W / Electronic	2	2	45	90
Linear Fluorescent 7: F8A: 48" T8 32W / Electronic	2	4	65	260
Linear Fluorescent 8: F9: 48" T8 32W / Electronic	2	12	65	780
Linear Fluorescent 9: F9A: 48" T8 32W / Electronic	4	2	125	250
Compact Fluorescent 1: FR1: Triple 4-pin 32W / Electronic	2	12	85	1020
Compact Fluorescent 2: FR2: Quad 2-pin 26W / Electronic	1	18	28	504
Compact Fluorescent 3: FR3: Triple 4-pin 32W / Electronic	2	4	85	340
Parking Garage (38000 sq.ft.)				
Linear Fluorescent 13: F6: 48" T8 32W / Electronic	6	71	190	13490
Workshop (12152 sq.ft.)				
Linear Fluorescent 10: F6: 48" T8 32W / Electronic	6	21	190	3990
Linear Fluorescent 11: F10: 46" T5 HO 54W / Electronic	3	9	190	1710
Linear Fluorescent 12: F11: 48" T8 32W / Electronic	6	6	190	1140
			Total Proposed Watts =	35879

Section 3: Compliance Calculation

If the Total Allowed Watts minus the Total Proposed Watts is greater than or equal to zero, the building complies.

Total Allowed Watts =	53781
Total Proposed Watts =	35879
Project Compliance =	17902

Interior Lighting PASSES: Design 33% better than code.

COM*check* Software Version 3.6.1

Exterior Lighting Compliance Certificate

2006 IECC

Section 1: Project Information

Project Type: **New Construction**
Project Title : Waukee Public Works

Construction Site:
Waukee, IA

Owner/Agent:
John Gibson
City of Waukee
Waukee, IA 50263

Designer/Contractor:
Twin Rivers Engineering Consultants
1000 Illinois Street
Des Moines, IA 50314

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (C x D)	F Proposed Watts
Parking area(s)	46248 ft2	0.15	Yes	6937	2275
Driveway	37581 ft2	0.15	Yes	5637	3185
Illuminated length of wall or surface	10 ft	5	No	50	420
Other entry/exit	275 ft of door width	20	Yes	5500	2870
Main entry/exit	3 ft of door width	30	Yes	90	80
Illuminated length of wall or surface	302 ft	5	No	1510	280
			Total Tradable Watts* =	18164	8410
			Total Allowed Watts =	19724	
			Total Allowed Supplemental Watts** =	986	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.

** A supplemental allowance equal to 5% of total allowed wattage may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Parking area(s) (46248 ft2): Tradable Wattage				
HID 1: MP1: Metal Halide 400W / Pulse start	1	2	455	910
HID 2: MP2: Metal Halide 400W / Pulse start	1	3	455	1365
Driveway (37581 ft2): Tradable Wattage				
HID 3: MP2: Metal Halide 400W / Pulse start	1	7	455	3185
Illuminated length of wall or surface (10 ft): Non-tradable Wattage				
HID 4: MF1: Metal Halide 175W / Pulse start	1	2	210	420
Other entry/exit (275 ft of door width): Tradable Wattage				
HID 5: MB1: Metal Halide 100W / Pulse start	1	18	140	2520
HID 6: MB2: Metal Halide 50W / Pulse start	1	2	75	150
HID 7: MB3: Metal Halide 70W / Pulse start	1	2	100	200
Main entry/exit (3 ft of door width): Tradable Wattage				
Compact Fluorescent 1: MB4: BIAX 39W / Electronic	1	2	40	80
Illuminated length of wall or surface (302 ft): Non-tradable Wattage				
HID 8: MB1: Metal Halide 100W / Pulse start	1	2	140	280
			Total Tradable Proposed Watts =	8410

Section 4: Requirements Checklist

Lighting Wattage:

☐ 1. Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.

Compliance: Passes using supplemental allowance watts.

Controls, Switching, and Wiring:

☐ 2. All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.

☐ 3. All lighting fixtures are controlled by a photosensor or astronomical time switch that is capable of automatically turning off the fixture when sufficient daylight is available or the lighting is not required.
Exceptions:

Covered vehicle entrance/exit areas requiring lighting for safety, security and eye adaptation.

Exterior Lighting Efficacy:

☐ 4. All exterior building grounds luminaires that operate at greater than 100W have minimum efficacy of 60 lumen/watt.
Exceptions:

Controlled by motion sensor or exempt from consideration under the provisions of Section 505.6.2.

Exterior Lighting PASSES: Design 0.0% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the 2006 IECC requirements in COM*check* Version 3.6.1 and to comply with the mandatory requirements in the Requirements Checklist.

Name - Title	Signature	Date